

REMARKS

Claims 1-6 are pending in the application and are rejected. The title of the application is objected to for being non-descriptive.

Title

Applicants amend the title as shown above and as shown on an enclosed amended Application Data Sheet.

Claim Rejections Under 35 U.S.C. § 112

Claims 1-6 are rejected under 35 U.S.C. § 112, second paragraph, for being indefinite. The Office Action indicates claims 1 and 5 are generally narrative, fail to conform to U.S. practice, and have grammatical and idiomatic errors. Specified informalities in claims 4 and 5 are mentioned.

In response, Applicants amend the claims as shown above and request reconsideration.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. patent 6,801,319 (referred to as "Szafraniec").

Applicants request reconsideration in view of the following comments.

Szafraniec does not disclose or suggest all features that are claimed. The gyroscope set forth in amended claim 1 comprises a first polarization maintaining fiber connected between the optical fiber coupler and the optical waveguide of the optical integrated circuit such that the light passing through the first polarization maintaining optical fiber is directly incident on the optical integrated circuit. This optical fiber also has "a polarization axis coincident with the direction of the TE mode in the optical waveguide." Szafraniec does not disclose or suggest this optical fiber.

The Office Action alleges that Szafraniec does disclose this polarization maintaining (PM) optical fiber and refers to col. 8 lns. 20-26 for support. The structure disclosed in this text differs from what is claimed. The disclosed structure includes a section of single mode (non-PM) optical fiber 458 from which light is directly incident on the optical integrated circuit.

The inventors recognized that light passing through single mode fiber experiences fluctuations in polarization, causing variations in the amount of leakage of the TM mode light in the optical waveguide circuit. This variation degrades the signal-to-noise ratio of the optical gyroscope and degrades its performance.

According to the invention as set forth in claim 1, the polarization of the light that is incident on the optical integrated circuit is fixed. The TE mode light and the TM mode light received from the PM fiber do not interfere with one another; ie, they are incoherent. As a result, the TM mode leakage in the optical integrated circuit does not cause fluctuations in the amount of light that passes through the optical integrated circuit, which increases the signal-to-noise ratio of the gyroscope and improves its performance.

In view of the foregoing discussion, it may be seen that the structure of the claimed gyroscope differs from what is disclosed in Szafraniec and this difference provides improvements in performance that is not suggested by the prior art.

Claims 2-4 are dependent on claim 1 and add further limitations.

Claim Rejections Under 35 U.S.C. § 103

Claims 5-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 5,854,678 (referred to as "Liu") in view of U.S. patent 5,136,667 (referred to as "Ohno").

Applicants respectfully traverse the rejection of these claims because the combination of Liu and Ohno does not disclose or teach all features that are claimed. The gyroscope set forth in both original claim 5 as well as amended claim 5 comprises a polarization maintaining (PM) optical fiber and a PM optical coupler connected between the light source and the optical integrated circuit. Neither Liu nor Ohno disclose or suggest the use of both optical fiber and coupler as claimed.

The Office Action alleges that Liu does disclose this PM fiber and PM coupler and refers to coupler 12 for support. Applicants respectfully disagree. None of the disclosed embodiments in Liu use both a PM coupler and a PM fiber as claimed. Referring to Fig. 1, the optical coupler 12 is PM but Liu does not disclose or suggest the claimed PM optical fiber (col. 1 ln. 66 to col. 2 ln. 10). Referring to Fig. 2, the coupler 12 is not PM (col. 4 lns. 4-5). Referring to Figs. 3A and 3B, Liu indicates optical couplers 66, 67 are PM but does not disclose or suggest the claimed PM optical fiber (col. 5 lns. 54 to col. 6 ln. 54; col. 7 lns. 1-10). Referring to Figs. 4A-4B, the couplers 66, 67 are not PM (col. 7 lns. 11-15 and col. 9 lns. 7-18).

Ohno also does not disclose these features. It may be seen the disclosed optical coupler 12 is not PM because Ohno teaches the use of a polarizer 13 "by which a polarized light component ... is extracted" from optical coupler 12 (col. 1 lns. 17-20).

Claim 6 is dependent on claim 5 and adds further limitations.

Amended Claims

Applicants are including pages that show the amended claims in a clear form, which may be more convenient for examination.

CONCLUSION

Applicants amend the claims and request reconsideration in view of the discussion set forth above.

Respectfully submitted,



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I certify that this Response to Office Action and any enclosed materials are being deposited with the United States Postal Service on August 10, 2006 with sufficient postage as first class mail in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.



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Enc. Amended claims in clean form
Amended Application Data Sheet
Check for \$450 for ext.-of-time fee